Chair of Computational Modeling and Simulation
TUM Department of Civil, Geo and Environmental Engineering
Technical University of Munich

Bachelorthesis:

Data Collection and Privacy-Aware Monitoring of TUM Kita Construction Site Using Camera-Based Systems

Description

Image datasets of construction sites are highly demanded to train deep learning networks, enabling the processing of diverse images or point clouds and retrieving information about on-site progress [1]. Therefore, this thesis is intended to develop a camera-based system to collect and analyze data at the TUM Kita construction site. The project will focus on real-time monitoring, progress tracking, image and video processing.

In addition to the technical aspects, this thesis will address important privacy concerns related to the collection and use of image data. It will explore methods for anonymizing data to protect the privacy of individuals present on the construction site, ensuring compliance with relevant data protection regulations. This will involve developing algorithms for automated anonymization, such as face and body blurring, as well as protocols for data handling and storage to safeguard sensitive information.

Task

- Conduct a literature review on existing construction monitoring systems.

- Establish protocols for secure data handling and storage to protect sensitive information.

- Develop scripts for video streaming and image acquisition.

- Create a server-based solution for data sharing.

- Analyze data for construction progress and safety insights.

- Test and validate system performance.

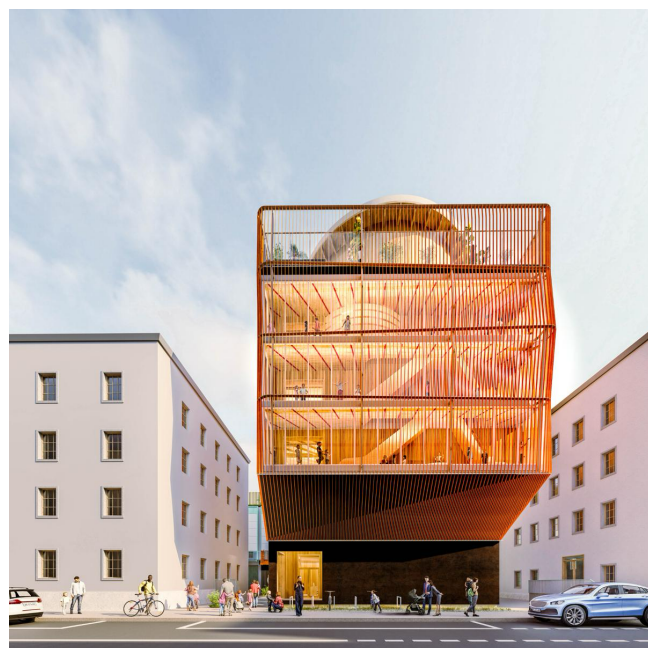- Document the entire monitoring process and present findings.

Figure 1: Kérés KITA (TUM-Campus)

Supervisor

Fabian Pfitzner, CMS, fabian.pfitzner@tum.de and Alex Braun, CMS, alex.braun@tum.de

References

[1] Pfitzner, F., Braun, A., & Borrmann, A. (2024). From data to knowledge: Construction process analysis through continuous image capturing, object detection, and knowledge graph creation. Automation in Construction, 164. https://doi.org/10.1016/j.autcon.2024.105451

[2] https://www.german-architects.com/de/architecture-news/meldungen/keres-kita-fur-den-tum-campus